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Next 1 Page(s) In Document Denied

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CAPACITY EXPANSION OF EAST GERMAN POWER PLANTS

[redacted]

1. At present, the East German power industry has an operable capacity of 3,000 megawatts and an installed capacity of about 4,500 megawatts. Last year [1954], an installed capacity [increase] of 685 megawatts was planned; actually, only 550 megawatts were installed. The plans mention an operable capacity of 480 megawatts. In 1955, 626 megawatts are planned to be added to the power net, 300 megawatts of which are planned for the first half of 1955. Of this latter amount, 195 megawatts are to be put in continuous service. It was originally intended to start replacing all power plants producing power at a cost of more than 0.10 DM per kilowatt-hour with plants producing power at a cost of up to .50 DM per kilowatt hour. Subsequently, this plan was withdrawn, since it would exert too great a drag on a continuing production of the industry.

2. The viewpoint has been adopted that to improve efficiency in condensing plants, it is necessary to change over to higher pressures and temperatures and to utilize larger machinery units.

3. The Elbe Power Plant at Vockerode is at present the most modern condensing plant in East Germany, possessing boilers with a capacity of 160 tons per hour, 84 atmosphere allowable gauge pressure, and 500 degrees centigrade, and 32-megawatt turbosets.

4. Installations of 132 atmospheres gauge pressure and 75-megawatt, double-shaft turbosets are already under construction. In 1956, attempts will be made to construct installations of 200 atmospheres maximum gauge pressure. To do so, however, the USSR will have to supply the necessary technical data. The purpose of these attempts is to reduce considerably the coal consumption for the power produced.

5. Long-range power plans further call for the construction of heat and power plants with an installed capacity of 300 megawatts by 1960, plus better utilization of power and heat.

6. In addition, it is hoped to set up a 1,100-kilometer, 220-kilovolt consolidated well-grounded net. Czechoslovakia has supplied the technical data for this plan. To the degree that the building of the 220-kilovolt net proceeds, the 110-kilovolt consolidated nets will be reduced to the level of Bezirk distribution nets while the local nets (Ortsnetze) will be built only as four-line, three-phase current nets of 220/380 volts.

7. At the same time, it is hoped to convert by 1960 the existing one-phase and two-phase alternating-current nets and the 127/220-volt three-phase nets. At [illegible], there is a 220-kilovolt long-distance line between Magdeburg, Wittenberg, and Guestrow, as well as a 110-kilovolt line between Pasewalk, Puerstenberg, and Gramese. Work is being done currently on the line between Trattendorf and Berlin; shortages of materials are causing difficulty, particularly in regard to cable, high-tension towers, and insulators and related parts. This net is of special importance to the supplying of power to the northeast part of East Germany.

8. In Bezirk Rostock it is planned to increase the capacity of the Peenemuende Power Plant to 120 megawatts. One 60-megawatt turbine has already been installed in the plant. The Bramo-Rostock Power Plant has a capacity of 55 megawatts; the Stralsund Power Plant, 12 megawatts; and the Wolgast Power Plant, two 2.5-megawatt units.

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9. The VEB Power Supply Enterprise in Erfurt (at Meister-Eckehard Strasse) is responsible for the area of south and west Thueringen and includes about 1,050 localities. The enterprise's output equals 135 megawatts; the most important power plants included in the enterprise are Erfurt I with 25 megawatts, Erfurt II-Gispersleben with 25 megawatts, and the VEB Bleicherode Potash Works with 0.8 megawatt. The capacity of the last-named power plant is to be raised to 8 megawatts in 1955 although this is greatly dependent on the "Gabelverbindung" [forked connector?].

10. There is a 100-kilovolt feedline (Einspeisung) between Grosskayna and Oberroeblingen over which about 20 megawatts can be transmitted.

11. A 100-kilovolt line links the Breitungen Power Plant near Suhl with Erfurt and Jena. A 30-kilovolt line leads directly to Eisenach with a second 30-kilovolt line to Eisenach via Gotha.

12. The Erfurt-Gispersleben transformer substation is linked with Arnstadt, Langewiesen, Weimar, Apolda, and Soemmerda by a 50-kilovolt line. These lines are double lines (doppelt besetzt). Although normally 380-volt three-phase current is carried, the local nets (Ortsnetze) for the most part still carry 220 volts.

13. The main power inspection office (Hauptenergie-Inspektion) and the main load distribution office (Hauptlastverteilung) for all East Germany is located in the Berlin-Friedrichsfelde transformer station on Marzahner Chaussee.

14. The following power plants are responsible for supplying power to Bezirk Halle: Zschornewitz, Elbe-Vockerode, Grosskayna, Karl Liebknecht, and Breitscheid, as well as the Dessau, Klostermannsfeld, Zeitz, and Quedlinburg net enterprises (Netzetriebe), plus the Bueschdorf repair plant.

15. By the end of 1955, the Zschornewitz Power Plant is to obtain the following: air compressor installation for 100 kilovolt-house (Haus), 100 kilovolt-regulating cell (Schaltzelle), dividing walls (Trennwaende), one set of tubular coolers for a high-voltage transformer, two cathode arresters (Kathodenfallableiter for electric coils, a cooling-water-equalizer channel (Kuehlwasser-Ausgleichskanal) cooling shields on the "Jungk" boilers in boiler-house F, and plastic bushings in place of steel bushings for the second inclined chain conveyer (Schraegbandkette). In addition, general repairs are to be made on the two cooling towers, on boilers F7 to F12, on the superheater for boilers E5 and E7, and on the 100-kilovolt transformer. There are to be new pipes in the condenser of unit 9, replacement of live-steam heating with dry-steam heating in the elevated bunker (Hochbunker), replacement of the condenser-pipe channels (Gassenrohre) of units 1-9, rebuilding of the boilers in boiler-house E, and gunite treatment (Torkretierung) of cooling tower 21. Zschornewitz has to reduce its coal consumption in 1955 from 2.6 kilograms per kilowatt-hour to 2.55 kilograms per kilowatt hour and must return 900 tons of steel scrap and 80 tons of nonferrous metal. The Golpa brown coal works supplies the coarse-grained coal (used at the plant). The proportion of female employees is to be increased from 11.6 percent to 12.2 percent.

16. The Rudolf Breitscheid Power Plant during 1955 is to reduce its coal consumption from 2.46 kilograms per kilowatt to 2.[illegible] kilograms per kilowatt hour and its steam consumption from 5.52 kilograms per kilowatt hour to 5.48 kilograms per kilowatt hour. In addition, plans call for rebuilding boiler 7 to achieve an increase in output, a partial blading (Teilbeschafelung) of turbine I to reattain the rated capacity, and introduction of the four-shift system in coal unloading.

17. The Greesknyna Power Plant is to improve the treatment of boiler feed water and to obtain new measuring and regulating equipment, a new degassing installation (Entgasung) for the "Benson" boilers, and a pneumatic ash-removal installation; turbine 6 and Benson boilers 1 and 2, including the measuring and regulating equipment, are to be overhauled.

18. In boilerhouse I of the Karl Liebknecht Power Plant, the uptake (Fuchs) of boilers 11-18 is to be linked with the uptake of boilers 19-24 to increase the steam output by 8 tons per hour. There will also be repair of the 50/12-atmospheres-gauge reducing station, improvement in the vacuum of unit IV, new steam jets in unit V, construction of a superheated steam cooler in the superheated steam pipeline (Leitung) of unit VI, and introduction of a means of separating unit VI from the cooling net. Unit VI is limited in regard to the temperature of the live steam it delivers. The unit operates as a bleeder steam-condensing unit together with the new back-pressure unit VII in delivering live steam to a net. Because of the temperature limitation of unit VI, an additional increase (operationally possible) of the steam temperature to the rated value of unit VII is not possible. This means, therefore, an output loss for unit VII. It is planned to install a superheated steam cooling system in the ducts of unit VI, so that then the boiler will be able to drive unit VII with a higher output temperature and the branch duct to unit VI will be cooled to the rated temperature. Since units VI and VIII share a common water cooling pipe with no intermediate separation, taking out unit VI for overhaul also means that unit VIII has to be cut off from the net, or else the condenser of unit VI will not be free of water. It is planned to install a cooling water cover plate at the intake of the unit VI condenser, so there will not be a loss in output with the subsequent removal of unit VIII.

19. The Dessau net enterprise (Netzbetrieb receives power from the Alten Power Plant. The following is planned for 1955: construction of a new rust-protective cover for boiler II, thereby assuring the power and steam output with the high-ballast content (ballastreich) coal already delivered which has a calorific value of 2,200 kilocalories; general repairs to one turbine, to the condensation ducts and tank, and to two plant cars at VEB Zoerbig Railroad Car Plant; rerouting of a 15-kilovolt cable from the "West" substation via Elisabeth/Stift strasse cold-storage plant (Kuehlhaus) to supply power to the cold-storage plant in Dessau; construction of a 15/5-kilovolt switch and transformer building in Dessau-Waldersee (Ziegeleistrasse) for improvement in the supply of power to the area of Waldersee/Mildensee; construction of a 15-kilovolt line in Burow-Coswig making possible an increased and sufficient supply of about 15 megawatts to the VEB Coswig Paper and Corrugated Cardboard Plant; and converting the direct-current secondary net (Teilnetz) in Koethen, Schmeideberg, and Aken to alternating current.

20. The Zeitz net enterprise obtains power from the Weissenfels, Zeitz, and Naumburg power plants, and delivers steam to the Weissenfels and Zeitz power plants. The 1955 plan calls for the following: providing three belt conveyers and a powerhouse crane to the Weissenfels power plant; providing an electric-drive centrifugal pump as a second feeding installation to the boiler units for the Zeitz power plant (inasmuch as the completely antiquated duplex pumps are very prone to breakdowns); rerouting of a second feeder cable in Naumburg; construction of a transformer station in Grosswilsdorf; installation of a compensating unit in the converter installation of plant II of VEB Zeitz, so that in the event of a disruption of the Zeitz Power Plant about 300 kilowatts can be fed into the direct-current net and thereby assure a supply of power to the most vital enterprises; and construction of a long-distance, high-speed (Schnelldistanz) relay in the Theissen transformer works for increased protection of the 15- and 35-kilovolt feed-ins and to reduce the disruption effect upon the Theissen power plant.

21. Concerning the Quedlinburg net enterprise, the following is planned; construction of a new transformer station in Bernburg-Wasserturm; construction of a transformer station in Bernburg (Lindenplatz); conversion to three-phase current; construction of a transformer station in Ballenstedt; replacement of the 15-kilovolt switch (Schalter) in the Quedlinburg power plant, since the oil switches (Oelschalter) are no longer usable; rerouting of the 15-kilovolt cable in the Bernburg local net (Ortsnetz) to link up with the new Lindenplatz transformer station when it is finished; conversion to three-phase current in Quedlinburg/Suederstadt; and "Fe" [iron?] replacement in the medium-voltage and local nets.

22. Individual power plants

a. On 28 June 1955, test operation of the 50-megawatt turbine in the Hirschfelde power plant began. However, because of damage to the cover (Deckelschaden), operation has since been halted. The Hirschfelde Power Plant and the Elsterberg Power Plant, located south of Greitz, deliver power to Czechoslovakia. On the other hand, the Pirna Power Plant receives low-temperature coke from Czechoslovakia. At the Stalinstadt Power Plant the third boiler heated with blast-furnace gas has been put in operation. At the Buna Power Plant 20 megawatts have been put into test operation, and at the VEB Zeitz Hydrogenation Plant, 10 megawatts. At the Muldenstein railway power plant the first turbine is now operating. A gas pipeline has been laid by the Lauchhammer and Groednitz power plant with 30 atmospheres gauge; the pipe has a diameter of 400 millimeters and was "UP"-welded [Comment: UP, Unterpulver, is a welding process known as Elmira in West Germany]. The Niederwartha pump storage power plant (Speicherwerk) is to receive three turbines from the Voith company, while the pressure pipe is to be delivered by the Man company in Augsburg. Three 50-megawatt topping turbines are planned for the Zschornewitz power plant.

b. The main department for power plant installations (Hauptabteilung Kraftwerksanlagen) has an allotment of 65 million DM for 1956. Included in this are various projects already begun, such as six power plants for China, seven power plant installations for Poland, four industrial power plants for a sugar factory in Rumania, a sugar factory in Indonesia, and two textile plants in Turkey. Concerning the 250-megawatt Polish power plant in Konin, East Germany will supply only the boilers, while Czechoslovakia will supply the turbines. In addition, two power plants are to be established in Stettin (Szczecin), Warsaw, and Auschwitz (Oswiecim).

c. There is a general storage of electronic regulating equipment. At the same time, there is an overcapacity for turbogenerators in Hennigsdorf, at Bergmann-Borsig, and at the VEB Sachsenwerk in Niedersedlitz. In addition, the Karl Leibknecht Transformer Works in Berlin and the transformer plant in Dresden are not loaded fully.

d. The USSR has withdrawn a contract for two 12.5-megawatt units from the VEB Turbine and Generator Plant in Berlin-Wilhelmsruh (Herzstrasse). It is planned that this plant will produce 50- and 100-megawatt turbines for Trattendorf II (Schwarze Pumpe) and other power plants. Plans for a 125-megawatt turbine are supposed to be ready by the end of 1956, although preliminary work has still not been started. The same plant has received research contracts for the designing of marine turbines of 15,000 shaft horsepower for a "Fahrerschiff" [passenger ship] and of 12,500 shaft horsepower for a merchant ship. The preliminary plans (Vorprojekt) are to be completed by the end of 1955.

23. The GDR power plan for the first half of 1955 lacked 4 percent of fulfillment.

TRATTENDORF POWER PLANTS

Output of turbines when fully utilized will be 25,000 kilowatt-hours. Boilers will have a capacity of 125 tons of steam per hour. Trattendorf II, "Schwarze Pumpe", will be equipped with back-pressure turbines. Trattendorf III, located west of the Spree River near Spremberg, will be equipped with high-pressure and low-pressure turbines (Vor-und Nachschaltturbinen).

Preliminary construction work is now being carried out for Trattendorf II, and for the coking plant. So far, Trattendorf III has only one 25-megawatt turbine. A second turbine was supposed to start its trial run on 30 June 1955, but still has not been put in operation. At Trattendorf III all cable has to be relaid because it has been heavily damaged by nails. Turbines III and IV are supposed to be installed this year [1955]. Preliminary work for the construction of the auxiliary machinery building has not yet been concluded. Moreover, there is a shortage of 1,500 workers needed for the construction of Trattendorf I.

Work has also started on the construction of a 220,000-volt line between Trattendorf and Berlin; the line will be 130 kilometers long. Most of the power produced at Trattendorf will be transmitted over this line to Berlin and to the area north of Berlin. According to plans, the line to be completed in 31 December of this year. However, difficulties are being encountered in the production of the approximately 400 towers and the cable required for this line. The Riesa Steel and Rolling Mill is not supplying enough angle iron for the towers and the Wire and Cable Works in Rothenburg is behind in its deliveries of cables; moreover, the Frankfurt/Oder Construction Union so far has not started laying the foundation for the Berlin-Ost transformer station, and as a result the VEB Berlin Installation Construction Plant (Anlagenbau) cannot start assembling equipment.

Trattendorf will receive its coal supply from the John Schehr Brown-Coal Works in Laubusch. In 1957, the new Bluno open-pit mine will start supplying coal to Trattendorf. According to plans, 12 million cubic meters of overburden are to be removed in 1957. To achieve this goal, the Finkerherd and Skado brown-coal works have made their conveyers available to the Bluno mine. However, it is not expected that the planned raw-brown-coal production of 6 million tons yearly will be achieved at the Bluno mine before 1958. The Bluno mine will also supply the raw coal for the coking plant planned for construction in Trattendorf.

"SONNE" AND LAUTA POWER PLANTS
(Enclosure E, dated 21 July 1955)

The "Sonne" Power Plant is being specially expanded for the brown-coal industry. At the end of 1954, equipment with capacities totaling 20 megawatts was undergoing test runs at the "Sonne" plant. Two 8-megawatt units are supposed to be added this year [1955]. The power plant has also received 14 new crushing mills.

The Lauta Power Plant is being expanded to supply the aluminum industry which is to be established in this area. At the end of 1954, the Lauta plant had an installed capacity of 83 megawatt. Actual production was 500 million kilowatt-hours. According to plans, the plant capacity is to be increased to 133 megawatts this year by the installation of four 12.5-megawatt units. It will then be able to produce 930 million kilowatt-hours [annually]. Six new boilers have been assembled.

ELBE POWER PLANT AT VOCKERODE

50X1-HUM

The Elbe Power Plant at Vockerode is East Germany's largest. The plant is subordinate to VEB Halle Supply Enterprise (Energieversorgung). Because of its central location, it was decided in 1950 to expand the existing installations. The designers decided on a boiler working pressure of 80 atmospheres gauge at 50 degrees centigrade, which results at the turbines in a kick-off pressure of 71 atmospheres absolute at about 50 degrees centigrade. Moreover, it was decided to add a third group of three turbosets to the first two groups, each of which also consists of three turbosets. Each turboset has a capacity of 32 megawatts. According to plans, the sixth of the nine planned turbines is to be assembled and connected to the network by the end of this year [1955]. This turbine was delivered by VEB Bergmann-Borsig in Berlin on 27 June 1955. According to plans, a total of three 32-megawatt turbines are to be installed in the plant in 1955. The plant's fifth turbine was assembled on 24 June 1955. On 3 May 1955, the plant received a superheated steam cooler from VEB Karl Liebknecht [Heavy machinery] Plant in Magdeburg; the same enterprise is producing four boilers for the power plant.

Plans call for increasing the proportion of women workers at the plant from 11.6 to 12.2 percent.

The raw brown coal used at the power plant has a calorific value of about 2,000 kilocalories per kilogram; it is transported to the plant from the Golpa and Bergwitz open-pit mines and from the new Muldenstein mine by a standard-gauge railroad.

Located in front of the power plant is the 6-kilovolt installation, separated by a road from the 110-kilovolt installation which is located further south. The two installations are connected by a switching installation, bridging them. The electric power produced is transmitted into the network (Landesnetz) by way of the 110-kilovolt installation. For the plant's own power requirements (Eigenbedarf) the high-voltage current is fed back into two separate 6-kilovolt main distribution installations (Eigenbedarfshauptverteilungen). Direct reserve feeding of generators 2 and 3 is provided for in the first construction unit. The turbosets are located against the boiler house wall so that each boiler (160 tons per hour) can be connected with its appropriate 32-megawatt turboset by block switching.

The radiation boilers for the power plant were developed in collaboration with VEB Karl Liebknecht Plant in Magdeburg-Buckau; this enterprise has designed and built a water-tube radiation boiler (Zweizugwasserrohrstrahlungskessel) with a maximum capacity of 160 tons of steam per hour at a permissible pressure of 84 atmospheres gauge, a working pressure of 80 atmospheres gauge, and a superheated steam temperature of 500 degrees centigrade. The normal load of the boiler is about 135 tons per hour.

The turbosets, which are being produced by VEB Bergmann-Borsig, are twin-housing condensing turbosets with capacities of 32 megawatts at 3,000 rpm with directly coupled 40-megavolt-ampere generators. The live-steam pressure at the quick-closing valve is 71 atmospheres absolute at a superheated steam temperature of 485 degrees centigrade. The turbines are designed for river water and a back-pressure of 0.04 atmosphere absolute. The high-pressure turbine consists of a double-rim action wheel with a diameter of 1,200 millimeters, nine single-rim wheels with a diameter of 900 millimeters, and four single-rim wheels which have a diameter of from 1,200 to 1,350 millimeters. The separately housed low-pressure section is constructed as a double-current turbine (Doppelstromturbine), with three single-rim wheels attached on each of both sides of the medium inlet.

The end stage has an average diameter of 1,800 millimeters. The end blades are 450 millimeters long. The steam throughput amounts to about 130 tons per hour, of which about 100 tons per hour go into the condensers; the remaining 30 tons per hour is tapped at five points for heating up the turbine condensate. The high-pressure turbine operates according to the impulse process, while the low-pressure turbine is accomplished by means of a mechanical-hydraulic mechanism. Each of the condensers, which stand at right angles to the turbine, has a cooling area of 2,250 square meters. The turbosets are equipped with double steam-jet air exhausts, oil containers with capacities of 8 cubic meters of oil, and two oil coolers each having a cooling area of 75 square meters. The 40-megavolt-ampere generator has an operating voltage of 6.3 kilovolts. Main and auxiliary exciters are provided. The turboset has a total length of 21 meters.

50X1-HUM

Data on the planned capacity of the Elbe Power Plant are as follows:

1. Over-all data on the power plant

Total capacity: 288 megawatts

Total quantity of coal: 453.2 tons per hour

Heat consumption (relating to the high-voltage side): 3,375 kilocalories per kilowatt-hour

Transmission voltage: 110 kilovolts

Weight of steel not including construction steel: 106 kilograms per kilowatt.

2. Boiler plant

Number of boilers: 9

Permissible pressure: 84 atmospheres gauge

Drum pressure: 80 atmospheres gauge

Superheated steam temperature: 500 degrees centigrade

Boiler capacity: 160 and 132 tons per hour

Efficiently: 82.5-83.5 percent

Feed-water temperature: 190 degrees centigrade

Volume of waste gas at 200 degrees centigrade per boiler: 127 cubic meters per second

Smokestack height: 140 meters

Inside diameter of smokestacks at top: 7.5 meters

Number and capacity of coal conveyer belts: two at 500 tons per hour each

Speed of conveyer belts: 2.09 meters per second

3. Turbosets

50X1-HUM

Number of turbosets: 9

50X1-HUM

Capacity of each turboset: 32,000 kilowatts

Number of revolutions: 3,000 rpm

Total volume of preheated steam per turboset: 124 tons per hour

Average diameter of output stages: 1,800 millimeters

Length of output blades: 450 millimeters

Generator voltage: 6.3 kilovolts

4. Water supply

Total water requirements; 61,490 cubic meters per hour

Number and capacity of cooling water pumps: 6 at 14,000 cubic meters per hour each

5. Feed pumps

Six turbopumps at 320 tons per hour each

Three "E" [electric] pumps at 160 tons per hour each

Feed-water temperature: 190 degrees centigrade

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50X1-HUM